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Building & Highway Material Testing Laboratory

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T-2377

Job No.: CTCE/BBMP/W.No.04/NLR/CSR-7/894d/CEMENT/2015-16

Date: 15.07.2015

TEST REPORT ON CEMENT

* CUSTOMER	:	**Asst. Executive Engineer,** Yelahanka New Town Sub Division, BBMP, Bangalore.
*AGENCY	:	**Mr. N. Lokanathreddy,** No.05, Kaverinagara, 7th Cross, Kavalbyrasandra, R.T. Nagara Post, Bangalore – 32.
*NAME OF THE WORK	:	Construction of concrete road 22nd Cross in 3rd Phase beside TATA Institute in Ward No.04, BBMP, Bangalore.
*REFERENCE	:	BBMP/AEE/YNSD/221/2015-16
SAMPLE ID	:	Cement
SAMPLE RECEIVED ON	:	13.07.2015
PERIOD OF TESTING	:	13.07.2015 to 15.07.2015

The results of the tests conducted on the cement sample are as follows:

Sl. No	Descriptions	Test Method as per IS	Test Result	Requirements as per IS: 8112-2013
1	Standard Consistency	IS-4031 (Part -4) 1988(RA-2009)	28.50 %	-
2	a) Initial Setting Time	IS-4031 (Part -5) 1988(RA-2009)	165 Minutes	Not Less than 30 Minutes
	b) Final Setting Time	IS-4031 (Part -5) 1988(RA-2009)	470 Minutes	Not More than 600 Minutes
3	Soundness by Le Chartlier Method	IS-4031 (Part-3) 1988(RA-2009)	1 mm	Not more than 10mm

*Information is furnished by the Customer/Representative.

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VISHWANATH .C
Quality Manager

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Job No.: CTCE/BBMP/W.No.04/NLR/WMM/AIV/2015-16 15.07.2015

Aggregate Impact Value

IS: 2386 Part IV

Customer	**Asst. Executive Engineer,** Yelahanka New Town Sub Division, BBMP, Bangalore.
Agency	**Mr. N. Lokanathreddy,** No.05, Kaverinagara, 7th Cross, Kavalbyrasandra, R.T. Nagara Post, Bangalore – 32.
Name of the Work	Construction of concrete road 22nd Cross in 3rd Phase beside TATA Institute in Ward No.04, BBMP, Bangalore.
Reference	BBMP/AEE/YNSD/221/2015-16
Source / Location	WMM Plant
Type of Mix	Wet Mix macadam
Date of Testing	15.07.2015

Sl No.	Details	Trial No. 1	Trial No. 2	Average
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	388	389	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	88	89	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	300	300	
4	Aggregate Impact value = percent fines	22.68	22.88	
	100* (W_2/W_1)%			22.78

Comments:

→ Maximum allowable Aggregate Impact value for Wet mix Macadam is 30%

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Job No.: CTCE/BBMP/W.No.04/NLR/WMM/S-T/2015-16 15.07.2015

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Client	**Asst. Executive Engineer,** Yelahanka New Town Sub Division, BBMP, Bangalore.
Agency	**Mr. N. Lokanathreddy,** No.05, Kaverinagara, 7th Cross, Kavalbyrasandra, R.T. Nagara Post, Bangalore – 32.
Name of Work	Construction of concrete road 22nd Cross in 3rd Phase beside TATA Institute in Ward No.04, BBMP, Bangalore.
Reference	BBMP/AEE/YNSD/221/2015-16
Technical Reference	IS 2386(Part 1) 1963 (RA 2011)
Type of Mix	Wet Mix Macadam
Date of Testing	15.07.2015

Result : Flakiness Index = **12.13%**

Elongation Index = **13.39%**

Result : Combined Flakiness & Elongation index 25.52%

Comments:

Maximum allowable Flakiness & Elongation Index for Wet Mix Macadam is 30%

Note:

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Job No.: CTCE/BBMP/W.No.04/NLR/CSR-7/894d/QB(BC)/2015-16 27.08.2015

TEST REPORT ON DETERMINATION OF BITUMEN CHARACTERISTICS

***CUSTOMER**	:	**Asst. Executive Engineer,** Yelahanka New Town Sub Division, BBMP, Bangalore.
***AGENCY**	:	**Mr. N. Lokanathreddy,** No.05, Kaverinagara, 7th Cross, Kavalbyrasandra, R.T. Nagara Post, Bangalore – 32.
***NAME OF THE WORK**	:	Construction of concrete road 22nd Cross in 3rd Phase beside TATA Institute in Ward No.04, BBMP, Bangalore.
REFERENCE	:	BBMP/AEE/YNSD/221/2015-16
***SAMPLE ID**	:	Bitumen
DATE OF SAMPLING	:	25.08.2015
DATE OF TESTING	:	27.08.2015

The results of the tests conducted on the bitumen sample.

Sl. No	Description	Test Method as per IS	Test Result	Requirement as per IS:73:2013
1	Penetration at 25 ^{0}C, 1/10 mm	IS :1203 -1978 (RA-2009)	82	80 to 100
2	Softening point, ^{0}C	IS :1205 -1978 (RA-2009)	44	Min. 40
3	Ductility at 27^{0}C, cm	IS :1208 -1978 (RA-2009)	100 >	Min. 75
4	Flash Point, ^{0}C	IS :1209 -1978 (RA-2009)	302	Min. 220

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Job No.: CTCE/BBMP/W.No.04/NLR/BC/AIV/2015-16 27.08.2015

Aggregate Impact Value

IS: 2386 Part IV

Customer	**Asst. Executive Engineer,** Yelahanka New Town Sub Division, BBMP, Bangalore.
Agency	**Mr. N. Lokanathreddy,** No.05, Kaverinagara, 7th Cross, Kavalbyrasandra, R.T. Nagara Post, Bangalore – 32.
Name of the Work	Construction of concrete road 22nd Cross in 3rd Phase beside TATA Institute in Ward No.04, BBMP, Bangalore.
Reference	BBMP/AEE/YNSD/221/2015-16
Source / Location	Hot Mix Plant, Bangalore
Type of Mix	Bituminous Concrete
Date of Testing	27.08.2015

Sl No.	Details	Trial No. 1	Trial No. 2	Average
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	392	395	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	89	90	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	303	305	
4	Aggregate Impact value = percent fines 100* (W_2/W_1)%	22.70	22.78	22.74

Comments:

→ Maximum allowable Aggregate Impact value for Bituminous Concrete is 24%

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Job No.: CTCE/BBMP/W.No.04/NLR/BC/Shape_T/2015-16 : 27.08.2015

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Customer	: **Asst. Executive Engineer,** Yelahanka New Town Sub Division, BBMP, Bangalore.
Agency	: **Mr. N. Lokanathreddy,** No.05, Kaverinagara, 7th Cross, Kavalbyrasandra, R.T. Nagara Post, Bangalore – 32.
Name of Work	: Construction of concrete road 22nd Cross in 3rd Phase beside TATA Institute in Ward No.04, BBMP, Bangalore.
Reference	: BBMP/AEE/YNSD/221/2015-16
Technical Reference	: IS 2386(Part 1) 1963 (RA 2007)
Type of Mix	: Bituminous Concrete
Date of Testing	: 27.08.2015

Result : Flakiness Index = **12.36%**

Elongation Index = **13.96%**

Result : Combined Flakiness & Elongation index **26.32%**

Comments:

Maximum allowable Flakiness & Elongation Index for Bituminous Concrete is 30%

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Job No.: CTCE/BBMP/W.No.04/NLR/BC/Stripping/2015-16 28.08.2015

Stripping Value of Road Aggregates (Static Immersion Test)

IS: 6241

Customer	**Asst. Executive Engineer,** Yelahanka New Town Sub Division, BBMP, Bangalore.
Agency	**Mr. N. Lokanathreddy,** No.05, Kaverinagara, 7th Cross, Kavalbyrasandra, R.T. Nagara Post, Bangalore – 32.
Name of the work	Construction of concrete road 22nd Cross in 3rd Phase beside TATA Institute in Ward No.04, BBMP, Bangalore.
Reference	BBMP/AEE/YNSD/221/2015-16
Type of Mix	Bituminous Concrete
Date of Testing	28.08.2015

Type of binder : 80/100
Percentage of binder used : 5.0% by wt.
Total weight of aggregate : 200 g
Total weight of binder : 10.0 g
Temperature of water-bath : 40° C

Observation Number	Stripping, Percentage	Average, Percentage	Average Retained Coating, %
1	3.1	3.20	96.80
2	3.2		
3	3.3		

Comments:

→ Minimum allowable Aggregate retained coating for Bituminous Concrete is 95%

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Job No.: CTCE/BBMP/W.No.04/NLR/BC/Sp_Wa/2015-16 28.08.2015

Specific Gravity And Water Absorption Test

IS: 2386 Part III

Customer	**Asst. Executive Engineer,** Yelahanka New Town Sub Division, BBMP, Bangalore.
Agency	**Mr. N. Lokanathreddy,** No.05, Kaverinagara, 7th Cross, Kavalbyrasandra, R.T. Nagara Post, Bangalore – 32.
Name of the Work	Construction of concrete road 22nd Cross in 3rd Phase beside TATA Institute in Ward No.04, BBMP, Bangalore.
Reference	BBMP/AEE/YNSD/221/2015-16
Type of Mix	Bituminous Concrete
Source / Location	Hotmix Plant, Bangalore
Date of Testing	28.08.2015

Sl. No.	Details	Notation	Test Number			Mean Value
			Test 1	Test 2	Test 3	
1	Weight of aggregate suspended in water with the basket	W_1 g	2011	2012	2013	
2	Weight of basket suspended in water	W_2 g	755	755	755	
3	Weight of saturated aggregate in water	$(W_1 - W_2) = W_s$ g	1256	1257	1258	
4	Weight of saturated surface dry aggregate in air	W_3 g	2025	2026	2024	
5	Weight of water equal to the volume of the aggregate	$(W_3 - W_S)$ g	769	769	766	
6	Weight of oven dried aggregate	W_4 g	2018	2015	2005	
7	Specific Gravity	$W_4/(W_3-W_S)$	2.624	2.620	2.617	2.621
8	Apparent Specific gravity	$W_4/(W_4-W_S)$	2.648	2.658	2.684	2.664
9	Water Absorption	$((W_3-W_4)*100)/W_4$	0.35%	0.55%	0.95%	0.61%

Comments:

→ Maximum allowable Aggregate Water absorption value for Bituminous Concrete is 2.0%

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Job No.: CTCE/BBMP/W.No.04/NLR/BC/Agg/2015-16 28.08.2015

Aggregate Gradation Test

IS : 2386 Part I

Customer	**Asst. Executive Engineer,** Yelahanka New Town Sub Division, BBMP, Bangalore.
Agency	**Mr. N. Lokanathreddy,** No.05, Kaverinagara, 7th Cross, Kavalbyrasandra, R.T. Nagara Post, Bangalore – 32.
Name of theWork	Construction of concrete road 22nd Cross in 3rd Phase beside TATA Institute in Ward No.04, BBMP, Bangalore.
Reference	BBMP/AEE/YNSD/221/2015-16
Sample I / D	Hot Mix Plant, Bangalore
Type of Mix	Bituminous Concrete
Date of Testing	28.08.2015

Total Weight of Sample: **5200** gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	JOBMIX Gradation as per MORTH	Remarks
19	0	0	0	100	100	Gradation satisfies Bituminous concrete Grade-II specification as per MORTH
13.2	620	11.92	11.92	88.08	79 - 100	
9.5	465	8.94	20.87	79.13	70 - 88	
4.75	555	10.67	31.54	68.46	53 - 71	
2.36	610	11.73	43.27	56.73	42 - 58	
1.18	625	12.02	55.29	44.71	34 - 48	
0.600	540	10.38	65.67	34.33	26 - 38	
0.300	600	11.54	77.21	22.79	18 - 28	
0.150	460	8.85	86.06	13.94	12 - 20	
0.075	400	7.69	93.75	6.25	4 - 10	

Total Weight of Sample: **5300** gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	JOBMIX Gradation as per	Remarks
19	0	0	0	100	100	Gradation satisfies Bituminous concrete Grade-II specification as per MORTH
13.2	615	11.60	11.60	88.40	79 - 100	
9.5	455	8.58	20.19	79.81	70 - 88	
4.75	600	11.32	31.51	68.49	53 - 71	
2.36	615	11.60	43.11	56.89	42 - 58	
1.18	645	12.17	55.28	44.72	34 - 48	
0.600	575	10.85	66.13	33.87	26 - 38	
0.300	610	11.51	77.64	22.36	18 - 28	
0.150	425	8.02	85.66	14.34	12 - 20	
0.075	445	8.40	94.06	5.94	4 - 10	

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Job No.: CTCE/BBMP/W.No.04/NLR/BC/Stability/2015-16 28.08.2015

TEST REPORT ON STABILITY OF MIX

Customer	:	**Asst. Executive Engineer,** Yelahanka New Town Sub Division, BBMP, Bangalore.
Agency	:	**Mr. N. Lokanathreddy,** No.05, Kaverinagara, 7th Cross, Kavalbyrasandra, R.T. Nagara Post, Bangalore – 32.
Name of Work	:	Construction of concrete road 22nd Cross in 3rd Phase beside TATA Institute in Ward No.04, BBMP, Bangalore.
Reference	:	BBMP/AEE/YNSD/221/2015-16
Source of location	:	Hot mix Plant, Bangalore
Type of Mix	:	Bituminous Concrete
Date of Testing	:	28.08.2015

The results of the tests conducted on the bituminous concrete mix sample are as follows:

Sl. No	Description	Test Result 1	Test Result 2	Requirement as per MORTH (Table 500-19)
1	Marshal Stability, Kn	9.50	9.65	9 Kn (min)
2	Marshal flow, mm	3.30	3.45	2 – 4
3	Percent air voids in Mineral Aggregate	3.65	4.25	3 – 6
4	Voids in Compacted Mix	14.10	14.50	13 – 15
5	Percent Voids filled with Bitumen	67.50	68.50	65 - 75
6	Density, g/cc	2.26	2.27	--

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